

Solar low-energy retrofit for an old housing block at Østerbro in Copenhagen.

Results from monitoring in an EU-Thermie supported building project with 76 apartments, AAB dept. 23, block F.



The aim of this EU-Thermie project was to introduce a global solar low-energy design to obtain a reduction of the district heating consumption of 50-60% compared to the situation before the retrofit.

Based on the monitoring programme it has been concluded that 51% of the district heating consumption has been saved compared to the situation before the retrofit. This is achieved by a 54% saving of the space heating consumption and in addition to this a 37.5% saving of energy use for domestic hot water in connection to the use of an installed solar DHW system.

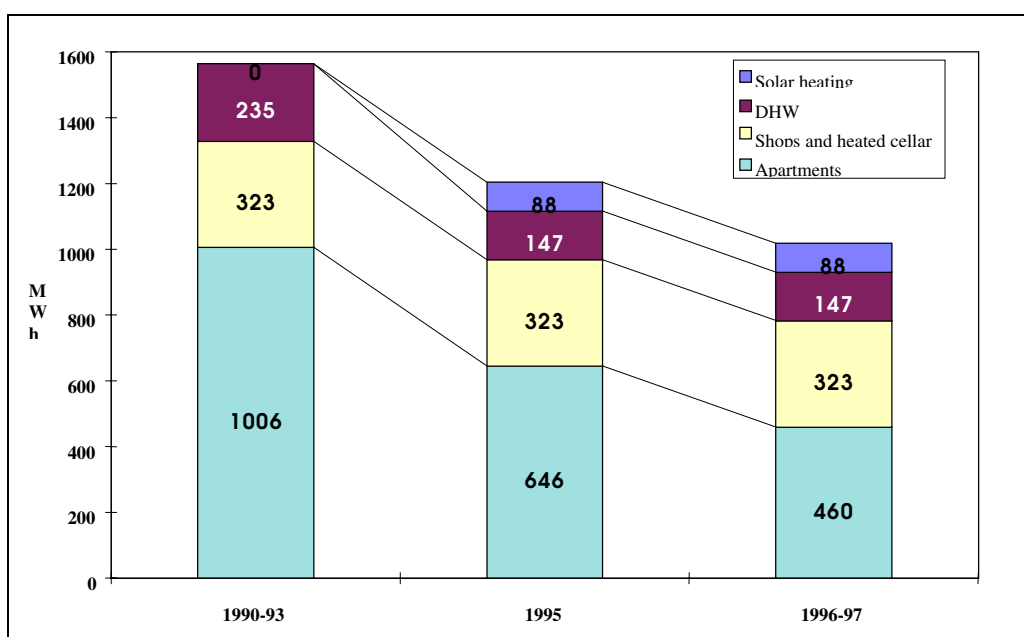
The yearly district heating consumption for the 76 apartments has been reduced from 1,241 MWh to 607 MWh, so the yearly district heating consumption after the retrofit is 61 kWh/m². This can be compared to the fact that the 50% best buildings of this type in Denmark have a yearly district heating consumption of 140 kWh/m² and for the 25% best buildings it is 102 kWh/m².

By the end of 1998 new valves have been installed in the radiator heating system and an improved regulation of this has also been made. Based on this

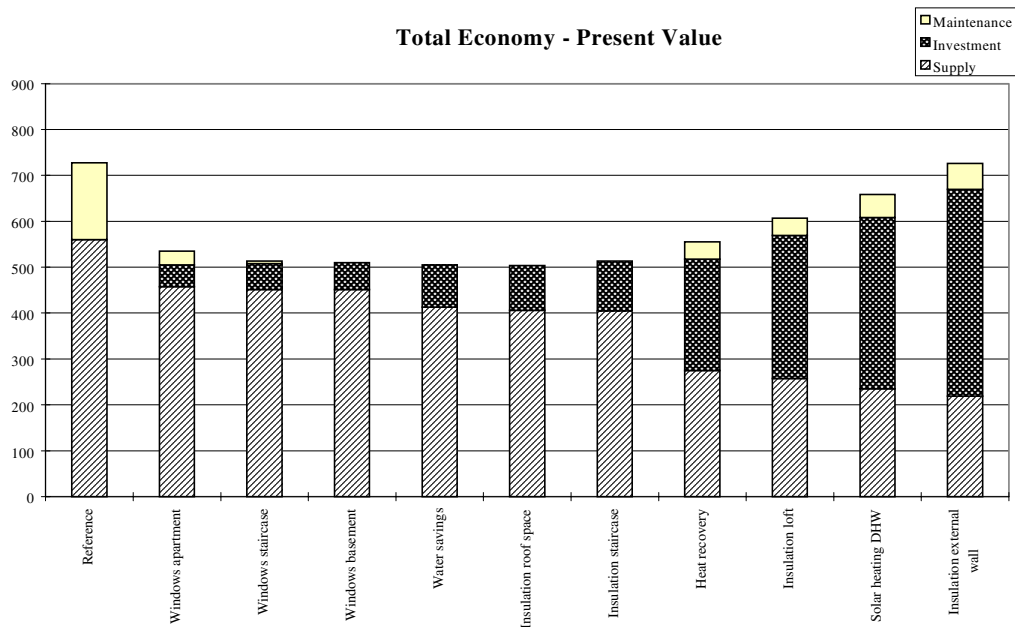
it is aimed to achieve an improved low temperature operation of the radiator system, so an even higher reduction of the yearly district heating consumption can be achieved.

The 4 most important technologies which reduced the space heating demand were: improved insulation incl. facade insulation on the facade facing the court yard, use of super low-energy windows, use of ventilation systems with counter flow heat recovery in all apartments, use of solar wall with transparent insulation.

The site of the project is at Østerbro between Østerbrogade, Hjortøgade, Tåsingegade and Langesund.



The distribution of district heating consumption before and after the retrofit project was realised in 1994/95.



Results from total economic optimisation of the neighbour housing block C.

An “Optibuild” calculation has been made to analyse the life cycle costs of different energy saving measures. You can see that super low energy windows are the most economic option compared to a reference situation.

Furthermore you can see that an energy saving package, which also includes water savings, some insulation measures and heat recovery ventilation, will lead to a total saving of district heating near 50% and with a favourable total economy for the tenants, incl. capital costs, maintenance costs and district heating costs (supply).

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